

Application Serial No. 10/807,289
Response dated November 16, 2006
Reply to Office Action of October 17, 2006

REMARKS

Applicants assume that Examiner's use of the term "gas generant" (which does not appear in the claims) is referring to the solid fuel component of the claimed mixture. Applicants' election is being made based on that assumption. In the event the Examiner meant otherwise, Examiner is respectfully requested to clarify the requirement, with specificity. Applicants hereby elect nitroguanidine as the solid fuel component. Further, Applicants hereby elect a powder shape for the solid fuel component. Claims 1-5, 10, 12-16 are generic. Claims 8-9 and 11 read on the elected species. Examination on the merits of elected claims 1-5 and 8-16 is respectfully requested.

The specification is also amended herein to clarify terminology. During prosecution of the parent application, it was suggested that the term nitrogen monoxide, as used in the first paragraph on Page 3 for example, is equivalent to dinitrogen monoxide, also known as laughing gas, nitrous oxide or N_2O , according to Hawley's Chemical Dictionary. However, the Merck Index equates the term nitrogen monoxide to mononitrogen monoxide, also known as nitric oxide or NO . Relevant excerpts from the Merck Index are submitted herewith. In the first paragraph on Page 3, amended herein for clarification, the critical temperatures and pressures were originally given for the two components, which as stated can be used together in a mixture, and comparing these values to the values provided for nitric oxide (NO) and nitrous oxide (N_2O) in the Merck Index, it is clear that these two different components were intended. Thus, the combination of NO and N_2O is fully supported by the specification, and the specification is amended for clarification consistent with the Merck Index in a manner that presents no new matter.

Claims 9 and 10 are also amended herein to insert commas omitted from the listing of elements in a manner consistent with the specification, such that no new matter is presented.

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An Action on the merits for claims 1-5 and 8-16 is respectfully requested.

Respectfully submitted,

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THE MERCK INDEX

AN ENCYCLOPEDIA OF
CHEMICALS, DRUGS, AND BIOLOGICALS

TWELFTH EDITION

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pp: W. Lwowski (1970). *Reviews*, R. A. Moss, vol. 2 (1981) pp.

lpetersäure (Gr%, N 22.23%, O lytic oxidation of es: F. D. Miles, Ford Univ. Press, *Ykopädie der tech*, 964). Purification a 18, 376 (1935). aplan, Schecters in Mellor's Vol. 278-352 (1967). stry vol. 2, J. C. Oxford, 1973) pr *Encyclopedia of* interscience, New Acid, Anhydrous, asteristic choking (onohydrate; mp of fusion: 250° 98.1°K): -79.1°; a negative azo- i constant boiling he oxide-free acid, ot discolor drops not be stored in f NO₂ which pro- abrics and animal traces of oxides if al Cr steels which acid. Oxidizing pentine, charcoal, is a water solu- s: d₄²⁰ 1.0036 (1% %); 1.1800 (30% %); 1.4134 (70% %). International ric Acid, Fuming, osure are irrita-; delayed pulmo-; dental erosion, Hazards (DHHS/ ical Toxicology of et al., Eds. (Wil- 4) Section III, pp

ganic nitrates and rmediates, explo- ls. Pharmaceutical r warts).

pared by distilla- ric acid; by treat- % H₂SO₄ and re- al crystallization and properties of l, 185-207 (1960).

nt to form NO₂, to nitrogen oxide 2. Forms white.

l as concentrated dioxide. May be g nitrogen dioxide organic reducing

fuming, very cor- us, yellowish-red oxide. The dens- increases: concd ; with 12.7% NO₂ agent has a den- in 90% HNO₃ by

titration with NaOH using methyl orange indicator. Misci- ble with water. Handle with extreme care. USE: In those organic reactions where nitric acid acts more as an oxidizing agent than as a source of hydrogen ions.

6674. Nitric Oxide. Mononitrogen monoxide; nitro- gen monoxide, NO; mol wt 30.01. N 46.68%, O 53.32%. Free radical found ubiquitously in mammals. Effector molecule synthesized from arginine, q.v., that participates in many diverse biological actions, including neurotransmis- sion, vasodilation, cytotoxicity of macrophages, and inhibi- tion of platelet aggregation. Prep'd industrially by passing air through an electric arc (basis of atmospheric nitrogen fixation) or by oxidation of ammonia over platinum gauze. Laboratory prep'n: Blanchard, *Inorg. Syn.* 2, 126 (1946); Schenk in *Handbook of Preparative Inorganic Chemistry* vol. 1, G. Brauer, Ed. (Academic Press, New York, 2nd ed., 1963) pp 485-487. Reviews: Beattie, "Nitric Oxide" in *Mel- lor's Vol. VIII, supplement II, Nitrogen* (part 2) 216-240 (1967); Jones in *Comprehensive Inorganic Chemistry* vol. 2, J. C. Bailar, Jr. et al., Eds. (Pergamon Press, Oxford, 1973) pp 323-334. Reviews of physiological role: S. Moncada et al., *Pharmacol. Rev.* 43, 109-142 (1991); A. R. Butler, D. L. H. Williams, *Chem. Soc. Rev.* 22, 233-242 (1993); P. L. Feldman et al., *Chem. Eng. News* 71, 26 (Dec. 20, 1993); of genotoxicity: K. Victorin, *Mut. Res.* 317, 43-55 (1994). Colorless gas. Burns only when heated with hydrogen. triple pt -163.6°. bp -151.8°. d-150.2 (liq) 1.27. Relative d (gas) 1.036 (air = 1). Absolute d (gas) 1.227 (air = 1). n_D²⁰ 1.0002697. Trouton constant 27.1. Contains an odd number of electrons and is paramagnetic. Crit temp, 92.9°. Crit press, 64.6 atm. Heat of formation (18°): -21.5 kcal/mole. Heat of vaporization (bp): 3.293 kcal/mole. Solubility in water (ml/100 ml; 1 atm): 7.38 (0°), 4.6 (20°), 2.37 (60°). Combines with oxygen to form NO₂ (a brown gas) and with chlorine and bromine to form the nitrosyl halides, such as NOCl, see N. V. Sidgwick, *Chemical Elements and Their Compounds* vol. I (Oxford, 1950) p 683. Caution: Potential symptoms of overexposure are irrita- tion of eyes, nose and throat; drowsiness; unconsciousness. See *NIOSH Pocket Guide to Chemical Hazards* (DHHS/ NIOSH 90-117, 1990) p 162. Inhalation may result in de- layed pulmonary edema. See *Matheson Gas Data Book* 6th ed. (1980) p 514. Immediately on contact with air, nitric oxide is converted to the highly poisonous nitrogen dioxide. Respiratory protection and adequate ventilation should be used to avoid overexposure. See *Patty's Industrial Hygiene and Toxicology* vol. 2F, G. D. Clayton, F. E. Clayton, Eds. (John Wiley & Sons, New York, 4th ed., 1994) pp 4566-4591. See also Nitrogen Dioxide. USE: Manuf of nitric acid; in the bleaching of rayon; as stabilizer (to prevent free-radical decomn) for propylene, methyl ether, etc.

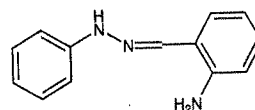
6675. Nitrilotriacetic Acid. N,N-Bis(carboxymethyl)- glycine; triglycollamic acid; α,α',α'-trimethylaminetricar- boxylic acid; tri(carboxymethyl)amine; triglycine; NTA. C₆H₉NO₇; mol wt 191.14. C 37.70%, H 4.75%, N 7.33%, O 50.22%. N(CH₂COOH)₃. Prep'n: Heintz, *Ann.* 122, 260 (1862); Michaelis, Schubert, *J. Biol. Chem.* 106, 331 (1934); Martell, Bersworth, *J. Org. Chem.* 15, 46 (1950); Singer, Weissberg, U.S. pats. 2,855,428 and 3,061,628 (1958 and 1962, both to Hampshire Chem.). IR studies: Nakamoto et al., *J. Am. Chem. Soc.* 84, 2081 (1962); Chapman et al., *Proc. Chem. Soc.* 1962, 336. Solubility data: Bird, *J. Soc. Dyes Col.* 56, 473 (1940). Toxicity data: *Soap Chem. Spec.* 42, 58 (1966). pK data: Schwarzenbach et al., *Helv. Chim. Acta* 28, 828 (1945). Review: Souchay, Graizon, *Bull. Soc. Chim. France* 1952, 34.

Prismatic crystals from hot water, mp 230-235° dec (Michaelis, Schubert). mp 241.5° (dec). 1.28 g dissolves in 1 liter of water at 22.5°, pH of satd aq soln is 2.3 (Bird). At 20° pK 3.03, pK₂ 3.07, pK₃ 10.70. Sodium salt, C₆H₇NNa₃O₆, NTA₃, Trilon A. MLD orally in rats > 4,000 mg/kg (Soap Chem. Spec.).

Note: Nitrilotriacetic acid may reasonably be anticipated to be a carcinogen: *Seventh Annual Report on Carcinogens* (PB95-109781, 1994) p 269.

USE: Chelating and sequestering agent; builder in synthet- ic detergents.

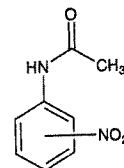
6676. Nitrin. 2-Aminobenzaldehyde phenylhydrazone. C₁₃H₁₃N₃; mol wt 211.27. C 73.91%, H 6.20%, N 19.89%. Prep'd by refluxing 2-nitrobenzaldehyde with phenylhydra- zine: Knöpfer, *Monatsh.* 31, 97 (1910).



Needles from acetone, mp 227-229° (dec). Sol in acetone. Sparingly sol in cold alcohol, ether, chloroform, benzene. A soln in alcohol or acetone develops a red color with nitrites upon addn of acid.

USE: Detection of nitrites, colibacilli in urine: Pfeiffer, *Münch. Med. Wochenschr.* 92, 1315 (1950).

6677. Nitroacetanilide. C₈H₈N₂O₃; mol wt 180.16. C 53.33%, H 4.48%, N 15.55%, O 26.64%.

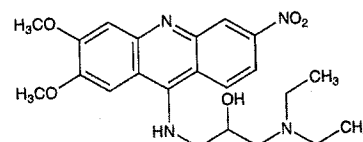


m-Nitroacetanilide, *N*-(3-nitrophenyl)acetamide, leaflets. mp 151-153°. Sparingly sol in hot water; freely sol in chloroform, nitrobenzene. Practically insol in ether.

o-Nitroacetanilide, yellow leaflets, d 1.42. mp 93-94°. Moderately sol in cold water, freely in boiling water, in cold fixed alkali hydroxide solns; sol in chloroform, alcohol, ether.

p-Nitroacetanilide, prisms. mp 214-216°. Almost insol in cold water. Sol in hot water, alcohol, ether; sol in KOH with orange color.

6678. Nitroakridin 3582. 1-Diethylamino-3-[(2,3-di- methoxy-6-nitro-9-acridinyl)amino]-2-propanol; 5-(γ-diethyl- amino-β-hydroxypropyl)amino-2-nitro-7,8-dimethoxyacri- dine; 9-(3-diethylamino-2-hydroxypropylamino)-6,7-dimeth- oxy-3-nitroacridine; nitroacridine 3582; W-1889; Entozon. C₂₂H₂₈N₄O₅; mol wt 428.49. C 61.67%, H 6.59%, N 13.08%, O 18.67%. Nitroacridine dye with antimicrobial activity. Prep'n: Bockmühl, Fehle, U.S. pat. 2,040,070 (1936 to Winthrop); BIOS rept. no. 766 (1946); Miller, Wagner, *J. Org. Chem.* 13, 891 (1948); Steck et al., *J. Am. Chem. Soc.* 79, 4414 (1957). Exptl use for *in vitro* identification of hypoxic cells: A. C. Begg et al., *Brit. J. Radiol.* 56, 970 (1983).



Crystals from acetone, mp 168-169°. Dihydrochloride, C₂₂H₂₈N₄O₅·2HCl, orange crystals, dec 219-220°.

THERAP CAT: Antiseptic.

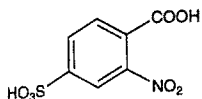
6679. m-Nitroaniline. 3-Nitrobenzenamine; *m*-nitranil- ine. C₆H₇N₂O₂; mol wt 138.13. C 52.17%, H 4.38%, N 20.28%, O 23.17%. Prep'n by nitration of aniline: Holleman et al., *Ber.* 44, 704 (1911); by reduction of *m*-dinitrobenzene: Brady et al., *J. Chem. Soc.* 1929, 2266; Kubota et al., *J. Pharm. Soc. Japan* 76, 801 (1956); Kuhn, U.S. pat 2,768,209 (1956 to Ringwood); from *m*-nitrobenzoic acid: Snyder et al., *J. Am. Chem. Soc.* 75, 2014 (1953).

Org. Syn. coll.

Golden-yellow, fan-shaped crystals. Sol in ~40 parts water, more sol in hot water; slightly sol in methyl or ethyl alcohol.

USE: As a reagent for cobalt and potassium.

6743. 2-Nitro-4-sulfobenzoic Acid. $C_7H_5NO_5S$; mol wt 247.19. C 34.01%, H 2.04%, N 5.67%, O 45.31%, S 12.97%. Prep by sulfonation of *o*-nitrotoluene and oxidation of the resulting 2-nitro-4-toluenesulfonic acid with potassium permanganate: Hart, *Am. Chem. J.* **1**, 352 (1879-80).



Needles from hydrochloric acid. Stable in air under ordinary conditions.

USE: Alkalimetric standard.

6744. Nitrosyl Chloride. $CINO$; mol wt 65.46. Cl 41.6%, N 21.40%, O 24.44%. $NOCl$. Best prepared from nitrosylsulfuric acid and dry HCl : Coleman *et al.*, *Inorg. Syn.* **1**, 55 (1939).

Non-explosive, very corrosive, reddish-yellow gas; liquid at -5.5° ; solid at -61.5° . Decomposed by water. Sol in fuming H_2SO_4 . Critical temp 167° ; crit press. 92.4 atm. The orange color of aqua regia is produced by nitrosyl chloride.

Caution: Intensely irritating to eyes, skin, mucous membranes. Inhalation may cause pulmonary edema, hemorrhage.

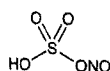
6745. Nitrosyl Fluoride. Nitrogen oxyfluoride. FNO ; mol wt 49.00. F 38.77%, N 28.58%, O 32.65%. Preparation: Ruff *et al.*, *Z. Anorg. Allgem. Chem.* **208**, 293 (1932); Balz, Mailänder, *ibid.* **217**, 166 (1934); Faloony, Kenna, *J. Am. Chem. Soc.* **73**, 2937 (1951); Kwasnik in *Handbook of Preparative Inorganic Chemistry* vol. 1, G. Brauer, Ed. (Academic Press, New York, 2nd ed., 1963) pp 184-185. Reviews: Hoffman, Neville, *Chem. Rev.* **62**, 1-18 (1962); Lemmitt, Sharp, *Advan. Fluorine Chem.* **4**, 194-195 (1965); Wolf, *ibid.* **5**, 1-30 (1965); Schmutzler, *Angew. Chem. Int. Ed.* **7**, 440-455 (1968).

Colorless gas. Often bluish because of impurities. Vigorous reaction with glass, corroding action on quartz. May be kept in quartz ampuls if cooled in liq oxygen. mp -132.5° ; bp -59.9° ; d (liq at bp) 1.326; d (solid) 1.719. Trouton const. 21.3. Reacts with water to form NO , HNO_3 and HF .

Caution: Highly irritating to skin, eyes, mucous membranes. See also Fluorine.

USE: Oxidizer in rocket propellants; stabilizing agent for liquid SO_2 ; fluorinating agent.

6746. Nitrosylsulfuric Acid. Sulfuric acid monoanhydride with nitrous acid; nitrosyl sulfate; chamber crystals; nitrososulfuric acid; nitroxylsulfuric acid; nitrosulfonic acid; nitrosyl hydrogen sulfate; nitro acid sulfate; Nitrore. $HN-O-SO_3H$; mol wt 127.08. H 0.79%, N 11.02%, O 62.95%, S 24.23%. Formed as an intermediate in the lead chamber process for sulfuric acid by the reaction of sulfur dioxide, nitrogen trioxide, oxygen, and water: Clément, Désormes, *Ann. Chim. Phys.* [1] **59**, 329 (1806); Lunge, *J. Chem. Soc.* **1**, 470 (1885). Prep from sulfur trioxide, nitrogen oxides and water: Döbereiner, *Schweigger's Journ.* **8**, 239 (1812); Claubry, *Ann. Chim. Phys.* [2] **45**, 284 (1832); Kuhlmann, *ibid.* [3] **1**, 116 (1843); from silver acid sulfate and nitrosyl bromide: Berl *et al.*, *Z. Anorg. Allgem. Chem.* **209**, 264 (1932). See also U.S. pats. 1,909,557 and 1,909,558. The formation of crystals of nitrosylsulfuric acid may be observed by igniting a mixture of 1 part sulfur and 2 or 3 parts potassium nitrate under a bell jar.



Prisms, dec 73.5° . In moist air the crystals dec with the formation of sulfuric and nitric acids and above 50° nitric

oxide and nitrogen dioxide are evolved. Sol in sulfuric acid, dec in water.

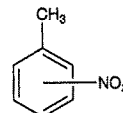
USE: For bleaching cereal milling products.

6747. Nitrosyl Tetrafluoroborate. Nitrosonium tetrafluoroborate; nitrosyl borofluoride; nitrosyl fluoborate. BF_4NO ; mol wt 116.81. B 9.26%, F 65.06%, N 11.99%, O 13.70%. $NOBF_4$. Prep according to the equation: $2 HBF_4 + N_2O_3 \rightarrow 2 NOBF_4 + H_2O$: Wilke-Dörfurt, Balz, *Z. Anorg. Allgem. Chem.* **159**, 219 (1927); Balz, Mailänder, *ibid.* **217**, 162 (1934); H. S. Booth, D. R. Martin, *Boron Trifluoride and Its Derivatives* (New York, 1949) p 133 sqq. Review of tetrafluoroborates: Sharp, *Advan. Fluorine Chem.* **1**, 68-128 (1960).

Birefringent, orthorhombic, hygroscopic platelets. d_4^{25} 2.185. Sublimes at 0.01 mm and 250° without decompn. Decomposed by water. May be stored in glass bottles if absolutely dry.

USE: In the prepn of diazonium fluoborates.

6748. Nitrotoluene. Methylnitrobenzene. $C_7H_7NO_2$; mol wt 137.14. C 61.31%, H 5.14%, N 10.21%, O 23.33%. Nitration of toluol by a mixture of HNO_3 and H_2SO_4 yields principally *o*- and *p*-nitrotoluol. Prep of *m*-nitrotoluene from 3-nitro-4-amino-toluene and $NaNO_2$: Clark, Taylor, *Org. Syn.* **3**, 91 (1923).



m-Nitrotoluene. Liquid. d_4^{15} 1.1630; d_4^{20} 1.1581; d_4^{25} 1.124; d_4^{30} 1.063. Solidifies in an ice and salt cooling mixture; melts at 15.5° . bp₇₆₀ 231.9°; bp₁₀₀ 156.9°; bp₄₀ 130.7°; bp₂₀ 112.8°; bp₁₀ 96.0°; bp₅ 81.0°; bp_{1.0} 50.2°. n_D^{20} 1.5426. Absorption spectrum: Marchlewski, Mayer, *Bull. Acad. Polon.* [A] **1929**, 188. Soly in water at 30° : 0.498 g/l. Miscible with alcohol and ether. Sol in benzene.

o-Nitrotoluene. Yellowish liquid at ordinary temp. d_4^{15} 1.1622. mp -10° . bp 222° . n_D^{20} 1.5472. Almost insol in water; sol in alcohol, benzene, petr ether.

p-Nitrotoluene. Yellowish crystals. d 1.286. mp $53-54^\circ$. bp 238° . Flash pt 106° . Almost insol in water; sol in alcohol, benzene, ether, chloroform, acetone.

USE: Manuf of dyes, toluidines, nitrobenzoic acids, etc.

6749. Nitrourea. N-Nitrocarbamide. $CH_3N_2O_3$; mol wt 105.05. C 11.43%, H 2.88%, N 40.00%, O 45.69%. $NH_2CONHNO_2$. Prep by the action of concd sulfuric acid upon urea nitrate: Thiele, Lachman, *Ann.* **288**, 281 (1895); Ingersoll, Armendt, *Org. Syn.* **5**, 85 (1925). By dropwise addition of HCl to a cooled mixture of silver cyanate and nitramide in water: Davis, Blanchard, *J. Am. Chem. Soc.* **51**, 1794 (1929).

Platelets from alcohol + petr ether dec $158.4-158.8^\circ$. K at $20^\circ = 7.0 \times 10^{-3}$. Absorption spectrum: Baly, Desch, *J. Chem. Soc.* **93**, 1753 (1908). Soluble in hot water, but water solns are unstable. Decompn in aq alkaline solns is almost instantaneous. Freely sol in acetone, alcohol, acetic acid. Sparingly sol in petr ether, chloroform, benzene. Stable to oxidizing agents. Can be detonated, but is not sensitive to percussion or heating.

6750. Nitrous Acid. HNO_2 ; mol wt 47.01. H 2.14%, N 29.79%, O 68.06%. Formed by the action of strong acids on inorganic nitrites. Review: Block, "Nitrous Acid, Hypo-nitrous Acid and their Salts" in *Mellor's Vol. VIII*, supplement II, *Nitrogen* (part 2) 353-408 (1967).

Known only in soln (pale blue in color). Weak acid. K (25°): 4.5×10^{-4} . In water it changes quickly into nitric oxide and nitric acid. Forms stable, water-sol nitrites with Li, Na, K, Ca, Sr, Ba, Ag. Does not form salts with weak polyvalent cations like Al or Be. Forms stable esters with alcohols.

6751. Nitrous Oxide. Dinitrogen monoxide; laughing gas; hyponitrous acid anhydride; facetious air. N_2O ; mol wt 44.01. N 63.65%, O 36.35%. Constituent of the earth's atm, about 0.00005% by volume: Slobod, Krogh, *J. Am.*

Chem. Soc. 72, 1175 (1950). Prepd by thermal decompn of ammonium nitrate: E. H. Archibald, *The Preparation of Pure Inorganic Substances* (Wiley, New York, 1932) p 246; Castner, Kirst, U.S. pat. 2,111,276 (1938 to du Pont). Preparation and purification: Schenk in *Handbook of Preparative Inorganic Chemistry* vol. 1, G. Brauer, Ed. (Academic Press, New York, 2nd ed., 1963) pp 484-485. The chief impurity of the commercial product is N_2 , although NO_2 , N_2O , and CO_2 may also be present. Teratogenicity study: G. A. Lane *et al.*, *Science* 210, 899 (1980). Reviews: Beattie, "Nitrous Oxide" in *Mellor's Vol. VIII*, suppl II, *Nitrogen* (part 2) 189-215 (1967); Jones in *Comprehensive Inorganic Chemistry* vol. 2, J. C. Bailar, Jr. *et al.*, Eds. (Pergamon Press, Oxford, 1973) pp 316-323.

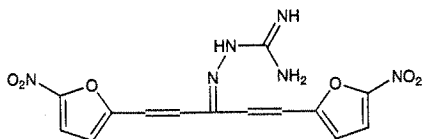
Colorless gas. Asphyxiant. Slightly sweetish odor and taste. Supports combustion. Very stable and rather inert chemically at room temperatures. Dissociation begins above 300° when the gas becomes a strong oxidizing agent. mp -90.81°; bp₇₆₀ -88.46°; Trouton constant 21.4; Hoge, *J. Res. Nat. Bur. Stand.* 34, 281 (1945). Dipole moment 0.166. d⁻⁸⁹ (liq) 1.226; d(S.T.P.) 1.967; d(gas) 1.53 (air = 1). Critical temp 36.5°; crit press. 71.7 atm. Heat of vaporization (bp): 3.956 kcal/mole. While in the steel cylinder nitrous oxide is compressed to the form of gas over liq and has a pressure of ~800 lbs/sq. in. at room temp. At 20° and 2 atm one liter of the gas dissolves in 1.5 liters of water. Freely sol in sulfuric acid. Sol in alcohol, ether, oils.

Caution: Narcotic in high concns. Less irritating than other oxides of nitrogen.

USE: To oxidize organic compds at temps > 300°; to make nitrites from alkali metals at their boiling points; in rocket fuel formulations (with carbon disulfide); in the prepn of whipped cream.

THERAP CAT: Anesthetic (inhalation); analgesic.

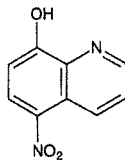
6752. Nitrovin. 2-[3-(5-Nitro-2-furanyl)-1-[2-(5-nitro-2-furanyl)ethenyl]-2-propenylidene]hydrazinecarboximidamide; [[3-(5-nitro-2-furyl)-1-[2-(5-nitro-2-furyl)vinyl]allylidene]amino]guanidine; sym-bis(5-nitro-2-furfurylidene)-acetone guanyldiazone; 1,5-bis(5-nitro-2-furyl)-3-pentadienone guanyldiazone; 1,5-bis(5-nitro-2-furyl)-3-pentadienone amidinohydrazone; Panazon; Payzone. $C_{14}H_{12}N_6O_6$; mol wt 360.29. C 46.67%, H 3.36%, N 28.33%, O 26.64%. Prepn: Uota *et al.*, *Japan. pat.* 2673(52)¹ (to Toyama), *C.A.* 48, 2115h (1954); Uoda, Tanizaki, *Japan. pat.* 4479(64) (to Fukuju Pharm.), *C.A.* 62, 10412f (1965).



Blackish violet crystals from ethyl alcohol, mp 217° (dec). Hydrochloride, mp 280° (dec).

THERAP CAT (VET): Growth promoter; antibacterial.

6753. Nitroxoline. 5-Nitro-8-quinolinol; 5-nitro-8-hydroxyquinoline; Enterocol; Nibiol; Noxibiol; Uritrol; Urocol. $C_9H_6N_2O_2$; mol wt 190.16. C 56.85%, H 3.18%, N 14.73%, O 25.24%. Prepn: Kostanecki, *Ber.* 24, 154 (1891); Petrow, Sturgeon, *J. Chem. Soc.* 1954, 570; Pratt, Duke, *J. Am. Chem. Soc.* 82, 1155 (1960). *In vitro* antibacterial and antifungal activity: A. Desvignes, P. Leguen, *Ann. Pharm. Franc.* 21, 803 (1963); M. Medic-Saric *et al.*, *Chemotherapy* 26, 263 (1980). Toxicological study: O. Angelova *et al.*, *Adv. Antimicrob. Antineoplastic Chemother.*, *Proc. 7th Int. Congr. Chemother.* 1, 507 (1972). Clinical pharmacokinetics: A. Mrhar *et al.*, *Int. J. Clin. Pharmacol. Biopharm.* 17, 476 (1979). HPLC determ in plasma and urine: R. H. A. Sorel *et al.*, *J. Chromatog.* 222, 241 (1981). Clinical evaluation in urinary tract infections: M. R. Jacobs *et al.*, *S. Afr. Med. J.* 54, 959 (1978); B. Cancet, A. Amgar, *Pathol. Biol.* 35, 879 (1987).

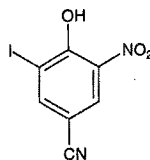


Yellow needles from alcohol or acetic acid, mp 179.5-181.5°. Freely sol in alkali and hot HCl; sparingly sol in alcohol, ether.

Hydrochloride, $C_9H_7ClN_2O_3$, yellow needles from alcohol, mp 258°.

THERAP CAT: Antibacterial.

6754. Nitroxynil. 4-Hydroxy-3-iodo-5-nitrobenzonitrile; Dovenix. $C_7H_3IN_2O_3$; mol wt 290.02. C 28.99%, H 1.04%, I 43.76%, N 9.66%, O 16.55%. Preparation: *Neth. pat. Appl.* 6,516,359 corresp to Collins *et al.*, U.S. pat. 3,331,738 (1966, 1967 both to May & Baker).



Yellow crystals from benzene, mp 137-138°. Sparingly sol in water; moderately sol in most organic solvents.

D-N-Methylglucamine salt, $C_{14}H_{20}IN_3O_3$, nitroxynil meglumine, 4-hydroxy-3-iodo-5-nitrobenzonitrile compd with D-1-deoxy-1-(methylamino)glucitol (1:1). Solid, mp 85-90°.

N-Ethylglucamine, $C_{15}H_{22}IN_3O_3$, nitroxynil eglumine, 4-hydroxy-3-iodo-5-nitrobenzonitrile compd with 1-deoxy-1-(ethylamino)glucitol (1:1), Trodax. Readily sol in water with a yellow, odorless and substantially neutral soln. Aq soln is very stable but contamination with calcium and certain other salts can result in pptn of an insol salt of nitroxynil.

THERAP CAT (VET): Anthelmintic (fasciolicide).

6755. Nitryl Chloride. Nitroxyl chloride. $ClNO_2$; mol wt 81.46. Cl 43.52%, N 17.19%, O 39.28%. NO_2Cl . Conveniently prepd by the addn of chlorosulfonic acid to nitric acid: Dachlauer, *Ger. pat.* 509,405 (1929 to I. G. Farben); Kaplan, Schechter, *Inorg. Syn.* 4, 52 (1953); Collis *et al.*, *J. Chem. Soc.* 1958, 438.

Corrosive, toxic, colorless gas. Chlorine-like odor. Vapor density (100°): 2.81 g/l. Dec > 120°. bp -14.3°; mp -145°. d₄²⁰ 1.37; d₄²⁵ 1.33. Even the purest liquid may have a pale yellow color. Solns in polar solvents are always yellow. The gas or liquid may attack organic matter with explosive violence.

Caution: Strong irritant, corrosive.

USE: Nitrating and chlorinating agent in organic syntheses.

6756. Nitryl Fluoride. FNO_2 ; mol wt 65.00. F 29.23%, N 21.55%, O 49.23%. Credit for original prepn by the spontaneous combustion of nitric oxide in an atm of fluorine is given to Moissan, Lebeau, *Compt. Rend.* 140, 1573, 1621 (1905); more easily prepd by mixing nitrogen dioxide and fluorine: Ruff *et al.*, *Z. Anorg. Allgem. Chem.* 208, 298 (1932); Faloan, Kenna, *J. Am. Chem. Soc.* 73, 2937 (1951). Reviews of prepn and chemistry: Hoffman, *Neville Chem. Rev.* 62, 1-18 (1962); Kwasnik in *Handbook of Preparative Inorganic Chemistry* vol. 1, G. Brauer, Ed. (Academic Press, New York, 2nd ed., 1963) pp 186-187; Kemmitt, Sharp, *Advan. Fluorine Chem.* 4, 195-196 (1965); Woolf, *ibid.* 5, 1-30 (1965); Schmutzler, *Angew. Chem. Int. Ed.* 7, 440-455 (1968).

Colorless gas. Pungent odor. Attacks mucous membranes. mp -166.0°. bp -72.4°. d (liq at bp) 1.796. d (solid) 1.924. Trouton const 21.2. May be stored in quartz ampuls if cooled in liq oxygen. Purification can be accomplished by fractional distillation at reduced press. in dry

glass or qt form nitri agent, with rine. Abs iodine, sele mony, bot warming iron, nick readily with ethyl nitrat

Caution: USE: Oxi

6757.

hydroxytri- scirp-9-en- 6.45%, O : Fusarium n 2519 (1968 2823. To (1968). Im Asia with 1 R. T. Rose (1982).

Crystals, ethanol). uv in water; sol g/10 g (Ta **Caution:** fever, naus, sepsis; necr horn, D. G. Treatment o pp 1312-13

6758. N 4-thiazolyl]n amine; N-[4 l-yl]-2-thia; ZE-101; ZI Gastrax; Na mol wt 331. 19.35%. His dine, q.v. Pr U.S. pat. 4,3 pharmacolog Forsch. 39, 2 suppression macol. Ther. metabolism Pharmacol. 2 humans: M. (1986). Sym Scand. J. Ga prehensive de of Drug Subs New York, 1



Crystals fro (methanol): am (e 11820, cent (octano form; sol in solns; slightl